REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. After amending the claims as set forth above, claims 17-19 and 22-39 remain pending in this application.

Rejection of claims 17-18, 20, 22, and 26-27 based on Goplen and Bourne

Claims 17-18, 20, 22, and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,011,922 ("Goplen") in view of U.S. Patent 2,297,046 ("Bourne"). The rejection is traversed for at least the following reasons.

Claim 17 (as amended) recites a muffler including, among other things, "a tubular member formed inside the muffler shell, wherein a portion of the tubular member is arranged inside the muffler shell on an upstream end of the muffler in a direction of exhaust flow...wherein a second end of the tubular member is in fluid communication with a space inside of the muffler shell, and wherein the tubular member is configured to attenuate acoustic energy of a first frequency band...a resonator set protruding from and formed of the portion of the tubular member, wherein the resonator set is configured to attenuate acoustic energy of a second frequency band." Goplen, Bourne, or any combination thereof does not teach or suggest this combination of features. For example, as the PTO correctly pointed out, Goplen does not teach or suggest a resonator set formed of the portion of the tubular member, wherein the resonator set is configured to attenuate acoustic energy of a second frequency band. (Paragraph 1 of the Office Action.) Bourne does not cure these deficiencies as detailed below.

One of the features of claim 17 is that the resonator set is formed of a portion of the tubular member which is formed inside the muffler shell. In contrast, Bourne primarily discloses structures of preventing shock excitation at places outside the muffler shell. (See reference numerals 4 and 5 (FIGS. 1-2); 12-14 (FIGS. 5-6); 18-20 (FIG. 7): 24-25 (FIG. 8); 31-34 (FIGS. 9-10); 41-46 (FIGS. 11-12); 52-53 (FIGS. 13-14); 52-54 (FIG. 15); 56-57 (FIGS. 16-17); 60 and 62 (FIGS. 18-19); 64 and 68 (FIGS. 20-21); 91 (FIGS. 24-25); 97-98 (FIG. 26); 97 and 103 (FIG. 27); 104 (FIG. 28); 115-118 (FIG. 30); 122 (FIGS. 31-32); 125 (FIG. 33); and 134 (FIG. 34).[1]) It is noted that the PTO asserts that the configuration of FIG. 9 of Bourne is used where shock excitation is unlikely or unimportant. (Paragraph 8 of the

[1] For the sake of full disclosure, FIGS. 22-23 of Bourne discloses a chamber 75 but there is no teaching or suggestion that a resonator set is protruding from and formed of a portion of the tubular member arranged on an upstream end of the muffler. FIG. 29 of Bourne applies to a chimney application, not a muffler.

Office Action.) It is respectfully submitted that Bourne does not provide such a teaching. Indeed, the passage from Bourne states: "[t]his type of device is useful in the case of short conduits wherein the production of higher harmonics by shock excitation is unlikely or unimportant." (Page 3, second column, lines 43-46 of Bourne.) In other words, the passage of Bourne is not saying that the shock excitation is unlikely or unimportant but the generation of higher harmonics caused by such shock excitation is unlikely or unimportant. Regardless, Bourne clearly does not teach or suggest the placement of the resonators inside a muffler shell.

The PTO asserts, however, that the combination of the holes 59 formed in the inlet tube 57 and the chamber 60 "will in fact be a resonance chamber the used [sic] in combination." (Paragraph 7 of the Office Action.) Additionally, the PTO asserts that:

> Adding the Bourne reference simply changes the kind of resonator used. The combination is proper in that the Bourne resonator will prevent sounding of the fundamental frequency as well as the second harmonic of the tube. Goplen is silent as to significantly reducing sound in the resonator chamber #60. Therefor [sic] it would have been obvious to one of ordinary skill to combine the two teachings to further attenuate the noise created in the Goplen apparatus. (Paragraph 7 of the Office Action.)

However, the resonators 31 and 32 of Bourne cannot be substituted for the holes 59 and the chamber 60 of Goplen because the holes 59 are the outlets of the inlet tube 57 so that the exhaust gas may enter the chamber 60.[2] (Column 4, line 68 to column 5, lines 5 of Goplen.) If the resonators 31 and 32 of Bourne are used in substitution of the holes 59 and chamber 60 of Goplen, the exhaust gas can no longer enter into the muffler of Goplen. Thus, the proposed substitution would have three effects as provided below.

First, the second end of the tube is no longer in fluid communication with the space inside of the muffler shell, which is a required feature of claim 17. Accordingly, the proposed combination does not teach or suggest all the features of claim 17.

Second, the proposed combination makes the muffler of Goplen unsatisfactory for its intended purpose because exhaust gas cannot flow through the muffler. One with ordinary skill in the art would not have a reason to perform the proposed substitution because such a substitution makes the muffler inoperative. (See MPEP 2143.01.[3])

---

[2] There is a flanged cap 58 on the tube 57 so that exhaust gas cannot exit through the end of the tube 57. (Column 4, lines 68 to column 5, lines 5 of Goplen.)

[3] "If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."

Finally, if the resonators 31 and 32 of Bourne are substituted for the holes 59 and chamber 60 of Goplen, the PTO asserts that "[t]he combination is proper in that the Bourne resonator will prevent sounding of the fundamental frequency as well as the second harmonic of the tube." (Paragraph 7 of the Office Action.) However, the feature of "wherein the tubular member is configured to attenuate acoustic energy of a first frequency band" is no longer satisfied because, by the PTO's own admission, only resonators 31 and 32 are attenuating acoustic energy and not the tubular member. Thus, the proposed combination does not teach or suggest all the features of claim 17.

Because there is no reason to substitute the holes 59 and chamber 60 of Goplen with the resonators 31 and 32 of Bourne and no combination of Goplen and Bourne teaches or suggests all the features of claim 17, claim 17 is not rendered unpatentable over the prior art.

Claims 18, 22, and 26-27 depend from and contain all the features of claim 17, and are allowable for at least the reasons above, without regard to the further patentable features contained therein.

Claim 20 has been canceled, which renders the rejection of this claim moot.

For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Rejection of claims 19, 21, and 28 based on Goplen, Bourne, and Coulon

Claims 19, 21, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Goplen, Bourne, and GB 2,365,066 ("Coulon"). Claims 19 and 28 depend from and contain all the features of claim 17. As previously mentioned, any combination of Goplen and Bourne does not teach or suggest all the features of claim 17 and the combination of Goplen and Bourne is improper. Coulon does not cure these deficiencies. Thus, claims 19 and 28 are allowable for at least this reason, without regard to the further patentable features contained therein. Claim 21 has been canceled, which renders the rejection of this claim moot. For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Rejection of claim 23 based on Goplen, Bourne, and De Lank

Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goplen, Bourne, and EP 0445431 ("De Lank"). Claim 23 depends from and contains all the features of claim 17. As previously mentioned, any combination of Goplen and Bourne does not teach or suggest all the features of claim 17 and the combination of Goplen and Bourne is improper. De Lank does not cure these deficiencies. Thus, claim 23 is allowable for at least this reason,

without regard to the further patentable features contained therein. For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Rejection of claim 24 based on Goplen, Bourne, Coulon, and De Lank

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goplen, Bourne, Coulon and De Lank. Claim 24 depends from and contains all the features of claim 17. As previously mentioned, any combination of Goplen and Bourne does not teach or suggest all the features of claim 17 and the combination of Goplen and Bourne is improper. Coulon and De Lank do not cure these deficiencies. Thus, claim 24 is allowable for at least this reason, without regard to the further patentable features contained therein. For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Rejection of claim 25 based on Goplen, Bourne, Burdisso, and De Lank

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Goplen, Bourne, U.S. Patent 6,112,514 ("Burdisso") and De Lank. Claim 25 depends from and contains all the features of claim 17. As previously mentioned, any combination of Goplen and Bourne does not teach or suggest all the features of claim 17 and the combination of Goplen and Bourne is improper. Burdisso and De Lank do not cure these deficiencies. Thus, claim 25 is allowable for at least this reason, without regard to the further patentable features contained therein. For at least these reasons, favorable reconsideration of the rejection is respectfully requested.

Allowability of claims 29-39

Claim 29 recites a muffler including, among other things, "a front end plate...wherein a tubular member serves as the front end plate...wherein a portion of the tubular member is arranged inside the muffler shell on an upstream end of the muffler in a direction of exhaust flow, wherein a first end of the tubular member is in fluid communication with the first exhaust tube, wherein a second end of the tubular member is in fluid communication with a space inside the muffler shell, and wherein the tubular member is configured to attenuate acoustic energy of a first frequency band...wherein the resonator set protrudes from and formed of the portion of the tubular member, wherein the resonator set is configured to attenuate acoustic energy of a second frequency band." None of the prior art teaches or suggests these features. For example, Goplen does not teach or suggest a resonator set formed of the portion of the tubular member; Bourne does not teach or suggest the placement of the resonators inside a muffler shell; and the resonators 31 and 32 of Bourne cannot be

substituted for the holes 59 and the chamber 60 of Goplen because the second end of the tube of Goplen is no longer in fluid communication with the space inside the muffler shell, the proposed combination makes the muffler of Goplen unsatisfactory for its intended purpose, and there is no tubular member configured to attenuate acoustic energy of a first frequency band. Coulon, De Lank, Burdisso, or any combination thereof fails to cure the deficiencies of the combination of Goplen and Bourne.

Furthermore, there is no teaching from the prior art that the input tube of Goplen serves as a front end plate of the muffler shell. The PTO asserts that Bourne teaches a resonator set formed of the portion of a tubular member 30 and when used in combination with Goplen is situated on a front end plate of the muffler protruding from the tubular member. (Paragraph 1 of the Office Action.) However, claim 29 requires that the tubular member serves as the front end plate, not merely situated on a front end plate. Because the prior art does not teach this feature, claim 29 is allowable for at least this additional reason.

Claim 34 recites a muffler including, among other things, a tubular member "wherein a portion of the tubular member is arranged inside the muffler shell on an upstream end of the muffler in a direction of exhaust flow, wherein a first end of the tubular member is in fluid communication with the first exhaust tube...wherein the tubular member comprises a plurality of through holes located on the tubular member's circumferential surface which is configured to attenuate acoustic energy of a first frequency band...a resonator set protruding from and formed of the portion of the tubular member upstream of the plurality of through holes, wherein the resonator set is configured to attenuate acoustic energy of a second frequency band." None of the prior art teaches or suggests these features. For example, Goplen does not teach or suggest a resonator set formed of the portion of the tubular member; Bourne does not teach or suggest the placement of the resonators inside a muffler shell; and the resonators 31 and 32 of Bourne cannot be substituted for the holes 59 and the chamber 60 of Goplen because the second end of the tube of Goplen is no longer in fluid communication with the space inside the muffler shell, the proposed combination makes the muffler of Goplen unsatisfactory for its intended purpose, and there is no tubular member configured to attenuate acoustic energy of a first frequency band. Coulon, De Lank, Burdisso, or any combination thereof fails to cure the deficiencies of the combination of Goplen and Bourne.

Furthermore, the resonators 31 and 32 of Bourne cannot be substituted for the holes 59 and the chamber 60 of Goplen because there would be no plurality of through holes located on the tubular member's circumferential surface which is configured to attenuate

acoustic energy of a first frequency band. Because the prior art does not teach this feature, claim 34 is allowable for at least this additional reason.

Claims 30-33 and 35-39 depend from and contain all the features of claim 29 or 34, and are allowable for the same reasons as claim 29 or 34, without regard to the further patentable features contained therein.

For at least these reasons, allowance of claims 29-39 is respectfully requested.

Conclusion

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date 10/26/2007

By _____

FOLEY & LARDNER LLP
Customer Number: 22428
Telephone: (202) 945-6162
Facsimile: (202) 672-5399

Pavan K. Agarwal
Registration No. 40,888

Matthew J. Kremer
Registration No. 58,671